to reversibly change a volume of the polymer gel, and includes a crosslinked polymer having at least a hydrogen bonding group,

wherein the crosslinked polymer included in the polymer gel is a copolymer of at least two monomer components including:

an alkyl(meth)acrylamide as a monomer component (A); and

a monomer different from the monomer component (A) as a monomer component (B), wherein the monomer component (B) is selected from the group consisting of a mono-substituted (meth)acrylamide, a di-substituted (meth)acrylamide, a (meth)acrylate derivative and a vinyl type monomer.

Thus, a thorough search of claim 1 would necessarily encompass a search for withdrawn claims 16, 18, 20, and 22, and would not place an undue burden on the Examiner. Because searching the entire application would not place an undue burden on the Examiner, MPEP §803 requires examination of the entire application.

Reconsideration and withdrawal of the Restriction Requirement are respectfully requested.

II. §102 REJECTION

The Office Action rejects claims 1 and 5-15 under 35 U.S.C. §102(b) as being anticipated by Akashi (U.S. Patent No. 6,287,485 to Akashi et al.). Applicants respectfully traverse this rejection.

Claim 1 recites:

A polymer gel composition comprising:

a swelling liquid; and

a polymer gel which has the characteristic of absorbing and releasing the swelling liquid due to a change in temperature so as to reversibly change a volume of the polymer gel, and includes a crosslinked polymer having at least a hydrogen bonding group,

wherein the crosslinked polymer included in the polymer gel is a copolymer of at least two monomer components including:

an alkyl(meth)acrylamide as a monomer component (A); and

a monomer different from the monomer component (A) as a monomer component (B), wherein the monomer component (B) is selected from the group consisting of a mono-substituted

(meth)acrylamide, a di-substituted (meth)acrylamide, a (meth)acrylate derivative and a vinyl type monomer.

Akashi fails to teach every feature of claim 1. Claims 5-15 depend from claim 1 and include all of its features.

Akashi discloses various embodiments of stimulus responsive polymer gels. In one embodiment, Akashi discloses that the "substance which responds to the stimulus caused by heat is preferably a cross-linked polymer having LCST (lower critical solution temperature) and an IPN (interpenetrating polymer network) composed of two components linked to each other by hydrogen bonding." See col. 7, lines 1-5. Akashi further discloses that the LCST component may be a poly[N-alkyl-substituted (meth)acrylamide]. See col. 7, line 8-10. Various examples of the LCST component are disclosed at col. 7, lines 8-17, and various examples of the IPN component are disclosed at col. 7, lines 17-28.

The Office Action argues that a poly[N-alkyl-substituted (meth)acrylamide] is an alkyl(meth)acrylamide, and that Akashi's disclosure of a cross-linked poly[N-alkyl-substituted (meth)acrylamide] satisfies the claim limitation "an alkyl(meth)acrylamide as a monomer component (A)." Applicants respectfully disagree, and assert that a poly[N-alkyl-substituted (meth)acrylamide] is <u>different</u> from an alkyl(meth)acrylamide.

As is well known in the art of polymer gel compositions, and in the art of organic chemistry generally, the alkyl group of an alkyl(meth)acrylamide is bonded to a carbon atom of the (meth)acrylamide. In contrast, the alkyl group of an N-alkyl(meth)acrylamide is bonded to the nitrogen atom of the (metha)acrylamide. Thus, an N-alkyl(meth)acrylamide is structurally-different from an alkyl(meth)acrylamide, and a disclosure of an N-alkyl(meth)acrylamide is <u>not</u> a teaching of an alkyl(meth)acrylamide.

Accordingly, in contrast to the Office Action's argument, Akashi's disclosure of a poly[N-alkyl-substituted (meth)acrylamide] as the LCST component does <u>not</u> satisfy the

claim limitation "an alkyl(meth)acrylamide as a monomer component (A)." For at least this reason, Akashi fails to teach or suggest every feature of claims 1 and 5-15.

In addition, Akashi also fails to teach the claimed copolymer of at least two monomer components including monomer component (A) and monomer component (B). In particular, Askashi also fails to teach the claimed monomer component (B). That is, even if Akashi's disclosure of a poly[N-alkyl-substituted (meth)acrylamide] as the LCST component satisfies the claimed monomoer component (A) limitation -- which it does not -- none of Akashi's disclosed IPN components satsfies the claimed monomer component (B) limitation.

At least because Akashi fails to teach the claimed monomer component (A) and monomer component (B), Akashi also fail to teach the claimed combination of these two monomer components. That is, Akashi also fails to teach the claimed copolymer of at least two monomer components including monomer component (A) and monomer component (B).

For at least these reasons, Akashi fails to teach every feature of claims 1 and 5-15. Specifically, Akashi fails to teach the monomer component (A), the monomer component (B), and the copolymer of at least two monomer components including monomer component (A) and monomer component (B), as required by claims 1 and 5-15. Accordingly, Akashi does not anticipate claims 1 and 5-15, and these claims are patentable over Akashi. Reconsideration and withdrawal of the rejection are respectfully requested.

III. §103 REJECTION

The Office Action rejects claims 1, 5-15, 17, 19, and 21 under 35 U.S.C. §103(a) as being obvious over Akashi in view of Ogawa (U.S. Patent No. 4,891,119 to Ogawa et al.). Applicants respectfully traverse this rejection.

A. Akashi in view of Ogawa fails to teach or suggest every claim limitation.

Claims 1 and 17 recite:

> a swelling liquid; and

> a polymer gel which has the characteristic of absorbing and releasing the swelling liquid due to a change in temperature so as to reversibly change a volume of the polymer gel, and includes a crosslinked polymer having at least a hydrogen bonding group,
>
> wherein the crosslinked polymer included in the polymer gel is a copolymer of at least two monomer components including:
>
> an alkyl(meth)acrylamide as a monomer component (A); and
>
> a monomer different from the monomer component (A) as a monomer component (B), wherein the monomer component (B) is selected from the group consisting of a mono-substituted (meth)acrylamide, a di-substituted (meth)acrylamide, a (meth)acrylate derivative and a vinyl type monomer.

For the reasons discussed above, Akashi fails to teach or suggest the monomer component (A), the monomer component (B), and the copolymer of at least two monomer components including monomer component (A) and monomer component (B), as required by claims 1 and 17.

Ogawa is cited for disclosing dispersing a water-soluble polymer within a three dimensional crosslinked polymer. However, Ogawa does not remedy the deficiencies of Akashi. That is, Ogawa also does not teach or suggest the monomer component (A), the monomer component (B), and the copolymer of at least two monomer components including monomer component (A) and monomer component (B), as required by claims 1 and 17.

For at least these reasons, Akashi, alone or in combination with Ogawa, fails to teach or suggest every limitation of claims 1 and 17. Claims 5-15 and 19 depend from claim 1 and claim 21 depends from claim 17. Accordingly, Akashi, alone or in combination with Ogawa, fails to teach or suggest every limitation of these dependent claims for at least the same reasons as claims 1 and 17.

B. There is no suggestion or motivation to combine the references.

Ogawa discloses an electrophoresis medium that contains a polyacrylamide gel formed by the cross-linking polymerization of an acrylamide compound and a cross-linking agent in the presence of water. See the abstract and col. 2, lines 40-43. Ogawa further

discloses that the electrophoresis medium provides a gel membrane that has satisfactory electrophoretic characteristics, is not broken easily, is handled easily, and is readily-processed for forming samples slots in option shapes. See col. 2, lines 29-39.

The Office Action argues that one skilled in the art would have been motivated to replace Ogawa's polyacrylamide gel with Akashi's polymer gel to practice the claimed invention in order to "provide a gel membrane that was not broken easily, easily handled, and readily processed for forming samples slots in option shapes." Applicants respectfully disagree, and assert that one skilled in the art would not have been motivated to replace Ogawa's polyacrylamide gel with Akashi's polymer gel.

It is Ogawa's specific polyacrylamide gel itself that provides the benefits cited by the Office Action as motivation. There is no disclosure in either Ogawa or Akashi that Akashi's polymer gel can meet or exceed the benefits provided by Ogawa's polyacrylamide gel. In particular, because Ogawa discloses that the polyacrylamide gel already provides those benefits, one skilled in the art of gel electrophoresis would not have been motivated to look to another reference for a substitute polymer gel in order to achieve these benefits -- the benefits are already provided by Ogawa's polyacrylamide gel.

The Office Action does not argue, and Akashi does not disclose, that Akashi's polymer gel can provide these electrophoresis benefits or any electrophoresis benefits at all. Thus, the Office Action, Akashi, and Ogawa all fail to provide any suggestion or motivation for one skilled in the art of gel electrophoresis to replace Ogawa's polyacrylamide gel (having specifically-desired electrophoresis benefits) with Akashi's polymer gel (with no disclosed electrophoresis benefits).

For at least these reasons, one skilled in the art of gel electrophoresis would not have been motivated to replace Ogawa's polyacrylamide gel with Akashi's polymer gel.

C. Conclusion

For at least the reasons discussed above, claims 1, 5-15, 17, 19, and 21 would not have been obvious over Akashi, alone or in view of Ogawa. Thus, claims 1, 5-15, 17, 19, and 21 are patentable over Akashi, alone or in view of Ogawa. Reconsideration and withdrawal of the rejection are respectfully requested.

IV. CONCLUSION

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 1 and 5-22 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

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JAO:PAC

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